

Patent claims

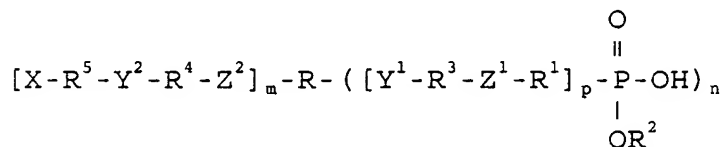
1. Compositions characterized in that they contain an acid and an organic polymer which has carboxyl and/or hydroxyl groups.

2. Composition according to claim 1, characterized in that it contains an acid which has a solubility of 0.5 to 20 wt.-% in water or in a mixture of 50 wt.-% water and 50 wt.-% ethanol.

3. Composition according to claim 1 or 2, characterized in that it contains an acid with protein- and/or calcium-precipitating properties.

4. Composition according to one of claims 1 to 3, characterized in that it contains as an acid a carboxylic acid, sulphonic acid and/or phosphonic acid.

5. Composition according to claim 4, characterized in that it contains a phosphonic acid of formula



in which

n is 1, 2, 3 or 4,

m is 0, 1 or 2,

p is 0 or 1,

R is a straight-chained or branched aliphatic hydrocarbon radical with 1 to 12 carbon atoms or an aromatic hydrocarbon radical with 6 to 12 carbon atoms or an aliphatic/aromatic hydrocarbon radical with 7 to 16 carbon atoms, which can be substituted by OH, NH₂ and/or COOR⁶,

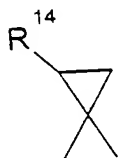
R¹ is a C₁ to C₁₂ alkylene, C₄ to C₁₂ cycloalkylene, C₆ to

C₁₂ arylene or C₇ to C₁₆ alkylenearylene radical, which can be substituted by OH, NH₂ and/or COOR⁶, or is absent,

R² is H, a C₁ to C₆ alkyl or a phenyl radical,

5 R³, R⁴ each mean, independently of each other, a C₁ to C₁₂ alkylene, C₆ to C₁₂ arylene or C₇ to C₁₆ alkylenearylene radical, which can be substituted by methyl, phenyl or fluorine, or are absent,

10 R⁵ is -CH=CR¹³-, a prop-1-ene-1,3-diyl, C₁ to C₆ alkenylene, C₃ to C₉ cycloalkylene, C₁ to C₆ alkylene or phenylene radical or a group of formula



R⁶ is H, a C₁ to C₆ alkyl or a phenyl radical,

Z¹, Z² each mean, independently of each other, CO-O, CO-NR⁷, O-CO-NH, O, NH, S or are absent,

20 Y¹, Y² each mean, independently of each other, O, CO-O, CO-NR⁸, O-CO-NH or are absent,

R⁷, R⁸ each mean, independently of each other, H, or a C₁ to C₆ alkyl radical,

X is H, CN, N(R⁹)₂, OR¹⁰, COOR¹¹ or CONR₂¹²,

25 R⁹, R¹⁰, R¹¹, R¹² each mean, independently of each other, H, a C₁ to C₁₀ alkyl or a phenyl radical,

R¹³ is H or a methyl radical,

R¹⁴ is H or a C₁ to C₁₀ alkyl, vinyl or phenyl radical.

30 6. Composition according to claim 5, characterized in that

n is 1 or 2 and/or

m is 1 and/or

p is 0 and/or

35 R is an aliphatic straight-chained or branched mono- to pentavalent alkane radical with 1 to 7 carbon atoms, an aromatic hydrocarbon radical with 6

carbon atoms or an aliphatic/aromatic hydrocarbon radical with 8 carbon atoms and/or

5 R^1 is a methylene or ethylene radical or is absent and/or

R^2 is H, a methyl or ethyl radical and/or

R^3, R^4 each mean, independently of each other, a methylene, ethylene, trimethylene, p-phenylene, ethylidene, 1-methylene ethane-1,2-diyl radical or are absent and/or

10 R^5 is a methylene, ethylene, trimethylene, ethene-1,2-diyl, methylethylene, prop-1-ene-1,3-diyl, or a cyclopropylidene radical monosubstituted in 2 position or is absent and/or

R^6 is H and/or

15 Z^1, Z^2 each mean, independently of each other, CO-O, O-CO-NH or O or are absent and/or

Y^1, Y^2 each mean, independently of each other, O, CO-O or CO-NR⁸ or are absent and/or

R^7, R^8 each mean, independently of each other, H or a methyl or ethyl radical and/or

20 X is H, CN, COOR¹¹ or CONR₂¹² and/or

$R^9, R^{10}, R^{11}, R^{12}$ each mean, independently of each other, H or a methyl, ethyl or phenyl radical and/or

R^{13} is H or a methyl radical,

25 R^{14} is H or a vinyl or phenyl radical.

7. Composition according to claim 5, characterized in that

30 n is 1,

 m is 1,

 p is 0,

 R is a C₁ to C₃ alkylene or phenylene radical,

R^2 is H,

R^4 is a branched or straight-chained C₁ to C₆ alkylene radical which can be substituted by 1 to 2 fluorine atoms and/or 1 phenyl radical or is absent,

35 R^5 is a 1-methylene ethane-1,2-diyl radical,

Z^2 is absent,
 Y^2 is O or is absent,
X is COOR^{11} and
 R^{11} is H or a C_1 to C_5 alkyl or phenyl radical.

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8. Composition according to claim 5, characterized in that

n is 2,
m is 2,
10 p is 1,
R is a quadrivalent aliphatic, aromatic, or aliphatic-
aromatic hydrocarbon radical with 2 to 12 carbon
atoms,
 R^1 is absent,
15 R^2 is H,
 R^3 is a C_1 to C_3 alkylene or phenylene radical or is
absent,
 R^4 is a branched or straight-chained C_1 to C_6 alkylene
radical which can be substituted by 1 to 2 fluorine
20 atoms and/or 1 phenyl radical or is absent,
 R^5 is a 1-methylene ethane-1,2-diyl radical,
 Z^1, Z^2 are absent,
 Y^1 is absent,
 Y^2 is O or is absent,
25 X is COOR^{11} and
 R^{11} is H or a C_1 to C_5 alkyl or phenyl radical.

9. Composition according to one of claims 4 to 8, characterized
in that it contains as carboxylic acid maleic acid and/or
30 trichloroacetic acid.

10. Composition according to one of claims 4 to 9, characterized
in that it contains as sulphonic acid sulphosalicylic acid
(2-hydroxy-5-sulphobenzoic acid).

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11. Composition according to one of claims 1 to 10,
characterized in that it contains 1 to 4 different acids.

12. Composition according to one of claims 1 to 11,
characterized in that it contains as a polymer a
polysaccharide, a polyethylene glycol, a polyacrylic acid,
a polyacrylamide, a polyvinylpyrrolidine or a mixture of
5 these substances.
13. Composition according to claim 12, characterized in that it
contains as a polymer a mixture of polyethylene glycol
dimethacrylate and polyacrylic acid.
- 10 14. Composition according to one of claims 1 to 13,
characterized in that it also contains fluoride ions.
- 15 15. Composition according to one of claims 1 to 14,
characterized in that it also contains a potassium ion-
releasing compound.
16. Composition according to one of claims 1 to 15,
characterized in that it also contains a film-forming
20 component.
17. Composition according to claim 16, characterized in that it
contains hydroxypropyl cellulose.
- 25 18. Composition according to one of claims 1 to 17,
characterized in that it contains
- | | |
|--------------------|------------------------------------|
| 0.5 to 40 wt.-% | phosphonic acid and/or |
| 1.0 to 40 wt.-% | carboxyl and/or hydroxyl-group- |
| 30 0.5 to 30 wt.-% | containing polymer and/or |
| 0.1 to 1.0 wt.-% | of a film-forming component and/or |
| 0.1 to 10 wt.-% | fluoride ions and/or |
| 0 to 97.8 wt.-% | potassium ions and |
| | solvent. |
- 35 19. Composition according to claim 18, characterized in that it
contains additionally 0.1 to 1.0 wt.-% flavourings.

20. Composition according to claim 18 or 19, **characterized in that** it contains as a solvent a mixture of ethanol and water.
- 5 21. Composition according to one of claims 18 to 20, **characterized in that** it contains
- | | |
|-----------------------|---|
| 1 to 5 wt.-% | of at least one phosphonic acid, |
| 3 to 7 wt.-% | polyacrylic acid, |
| 10 15 to 25 wt.-% | polyethylene glycol dimethacrylate, |
| 3 to 7 wt.-% | hydroxypropyl cellulose, |
| 0.1 to 1.0 wt.-% | potassium fluoride, |
| 0.05 to 0.2 wt.-% | flavouring and |
| 15 53.8 to 76.9 wt.-% | ethanol/water mixture (approx. 50 wt.-%). |
22. Kit containing an acid and in spatially separated form thereof an organic, carboxyl and/or hydroxyl-group-containing polymer.
- 20 23. Kit according to claim 22, **characterized in that** the acid is applied to a brush.
- 25 24. Kit according to claim 22 or 23, **characterized in that** it contains a solution of the polymer, the composition of which is measured such that, when the solution is combined with the acid of the kit, a composition according to one of claims 18 to 21 is obtained.
- 30 25. Kit according to one of claims 22 to 24, **characterized in that** acid and polymer are housed in different chambers of a double-chambered vessel.
- 35 26. Use of a composition as defined in claims 1 to 21 for the precipitation of protein.

27. Use of a composition as defined in claims 1 to 21 for the desensitization of teeth.
28. Use of a composition according to one of claims 1 to 21 for
5 the preparation of an agent for the desensitization of teeth.